Protocols for Adult Fish Facility Trapping Operations
Bonneville Dam

The following protocols will be implemented by agencies conducting research in the Bonneville Dam second powerhouse Adult Fish Facility (AFF). These protocols were coordinated with fish agencies and tribes through the Fish Passage Operation and Maintenance Coordination Team (FPOM). The purpose of these protocols is to provide measures to limit mortality resulting from stress when handling fish.

1. **General facility protocols.**
   - **1.1.** Users must have appropriate documentation for conducting research at the dam (See *Guide for Researchers at Bonneville Dam*). This includes valid state and federal permits that cover all listed species passing the project during the trapping period and users shall comply with all fish handling conditions in the permits. **Note: If permit conditions are more restrictive than the following protocols, users must follow permit conditions.**
   - **1.2.** The Corps reserves the right to terminate trapping operations at any time.
   - **1.3.** Users will be trained in the proper operation of the AFF to insure fish and personnel safety. Users may request training through the Project Biologists.
   - **1.4.** Bridge crane certification is required prior to operating the overhead crane. Training will not be provided by the Corps of Engineers.
   - **1.5.** Hard hats, long pants or raingear, steel-toed shoes or rubber boots are to be worn at all times. Shorts, tennis shoes, or sandals will not be permitted in the lab.
   - **1.6.** Water temperatures should be observed upon arrival and periodically during the day.
   - **1.7.** Personnel conducting research are required to be present in the AFF to divert desired fish into the anesthetic tank using the flume swing gates. While the AFF is in operation, flumes shall be open and a researcher must be on-site.
   - **1.8.** Undesired fish will be bypassed to the return pool.
   - **1.9.** The brail pool shall remain in the lowered position except during winter activities.
   - **1.10.** Researchers shall perform no maintenance on Corps owned/installed equipment. Nets may be mended as necessary.
   - **1.11.** Qualified users may lower the main ladder picket leads and downstream exit bulkhead when they arrive, and must raise the picket leads and downstream exit bulkhead when they are completed for the day.
   - **1.12.** Users will be permitted to operate valves 10 and 11 to control flow down the flumes at their discretion and to operate the raw water booster pump. Users may operate valve 12 to provide flow in the holding pool and valve 15 to drain water at the return pool.
   - **1.13.** Users must use a cotton mesh net, large enough to safely handle the largest fish passing the project during the trapping period.
   - **1.14.** Fish greater than 100 cm in length **will not** be diverted into the anesthetic tank. These fish will be allowed to return to the ladder untouched.

2. **Notification and Documentation**
   - **2.1.** Users will notify the control room when they set up and close down the lab.
   - **2.2.** Users will record the times picket leads are lowered and raised and which agency they are representing on the sheet provided by the project biologists.
   - **2.3.** Anytime lamprey are held overnight in the AFF, researchers will notify Project Fisheries and the Control Room.

2.4. Any and all mortalities must be immediately reported to a Project Biologist. The Project Biologist will examine the mortality and take any photos.

2.4.1. The researcher shall give a detailed report including:

A. Species
B. Origin
C. Length
D. Weight
E. Marks and injuries.
F. Cause and time of death
G. Future preventative measures.

2.4.2. All mortalities are included in the Project Fisheries weekly report and the reports are submitted to FPOM.

3. Trapping protocols when fish ladder water temperatures are <70°F.

3.1. There will be no time restriction for trapping operations.

3.2. There will be no more than four chinook, or four steelhead, or four sockeye, or any combination of four adult salmonids allowed in the anesthetic tank at any one time. This assumes that users can effectively track the length of time fish stay in the anesthetic tank.

3.3. There will be no more than one adult salmonid allowed in the small recovery tank at any one time. The brail pool is the primary and preferred recovery area.

Comment [MSOffice1]: This should be the case for Chinook or steelhead but we should be able about to hold up to 4 sockeye or jacks in that tank. This is most important to monitor fish after PIT tagging.

3.4. Water in the anesthetic tank will be replaced at least two times per day. Water temperatures in the anesthetic tank will be maintained within 2°F of the fish ladder water temperature. **Note: If anesthetic tank water temperature exceeds 70°F, criteria in section 4 will go into effect.**

3.5. Water in the small recovery tank will be running continuously to allow a constant exchange of water through the tank.

3.6. Personnel shall ensure fish are sampled as quickly as possible. It is recommended that it take no longer than 25 minutes to transition the fish from entry into the anesthetic tank to release back into the return ladder or transportation tank.

3.7. Personnel shall ensure that fish are fully recovered from anesthetization prior to release into the return ladder. Fish may volitionally leave the brail pool when they are ready.

3.8. When trapping is completed for the day, users will properly shut down the lab.

3.9. No more than two picket leads will be down while trapping activities are in operation. Additional leads may be requested through the Project Biologists.

3.10. Project biologists retain the authority to raise additional picket leads depending on fish densities and ladder conditions.

4. Trapping protocols when fish ladder water temperatures are >70°F.

4.1. Trapping will not occur when fish ladder water temperatures meet or exceed 70°F as measured in the brail pool. The only exception is for US v Oregon requirements.

4.1.1. Project Biologists will use the Corps temperature probe reading as the official temperature.

4.1.2. Temperatures are both instantaneous readings and 0000 to 2400 daily averages.

4.1.3. Project biologists will collect temperature data weekly from the data logger in the exit ladder. Daily checks may be requested when temperatures approach 70°F.

4.2. Sampling will be permitted 1-day per week from 0600- 1000 when water temperatures exceed 70°F to allow for mandatory steelhead sampling.

Comment [MSOffice2]: We would like to try and get this back to 3 days per week from 70-72 F. Currently we cannot sample enough fish in a single day to get a decent sample size which is impacting the TAC groups ability to set harvest rates which then relates to steelhead impacts which are a major bone of contention currently.

4.3. There will be no lamprey trapping or testing, unless previously coordinated with FPOM.

4.4. There will be no more than three adult salmonids in the anesthetic tank at a time. This assumes users can effectively track the length of time fish stay in the anesthetic tank.
4.5. The brail pool is the primary and preferred recovery pool.
4.6. The small recovery tank will only be used in emergencies. If used, there will be no more than one adult salmonid allowed in the small recovery tank at any one time.
4.7. If used, water in the small recovery tank will be running continuously allowing a constant exchange of water through the tank.
4.8. Assure oxygen levels are maintained at saturation in the anesthetic and recovery tanks. There will be no depression in oxygen levels in the anesthetic or recovery tanks. To assure this, water in the anesthetic tank will be replaced at least every three hours.
4.9. Maintain the anesthetic and recovery tank water temperatures 1-2°F lower than the ladder water temperature. If ice is used to cool the anesthetic or recovery tank water, the ice should be from river water or from an un-chlorinated water source. Do not exceed a 2°F difference between the anesthetic or recovery tank water and fish ladder water.
4.10. Personnel shall ensure fish are sampled as quickly as possible. It is recommended that it take no longer than 25 minutes to transition the fish from entry into the anesthetic tank to release back into the return ladder or transportation tank.
4.11. Personnel shall ensure fish are fully recovered from anesthetization prior to release. Fish may volitionally leave the brail pool when they are ready.
4.12. Project biologists retain the authority to raise additional picket leads depending on fish densities and ladder conditions.
4.13. This operation will remain in effect until daily average water temperatures drop to 69.5°F.

5. Winter trapping protocols, from December 01 through March 14. The purpose of these protocols is to provide measures to limit passage delay, and stress from overcrowding in the brail pool. Personnel conducting research during this time are not required to be present in the AFF. Users are allowed to activate the flume swing gates to divert all fish into the brail pool.
5.1. Fish will not be permitted to remain in the brail pool longer than 24 hours. It is recommended that handling of fish occurs daily by 1800 hours. This assures that if fish are sampled at the end of the day, most of the fish captured are only held from the morning until afternoon since passage at night is minimal, thus reducing delay.
5.2. During sampling, the brail pool should be raised and one adult salmonid netted, via a sanctuary net, and placed into the anesthetic tank at a time. After removing fish from the brail pool into the anesthetic tank, the brail pool will be lowered back to its full depth.
5.3. There will be no more than three adult salmonids in the anesthetic tank at a time. This assumes users can effectively track the length of time fish are in the anesthetic tank.
5.4. There will be no more than two adult salmonids in the recovery tank at a time.
5.5. Water in the recovery tank will be running continuously, allowing a constant exchange of water through the tank.
5.6. Personnel shall ensure fish are sampled as quickly as possible. It is recommended that it take no longer than 25 minutes to transition the fish from entry into the anesthetic tank to release back into the return ladder or transportation tank.
5.7. Personnel shall ensure fish are fully recovered from anesthesia prior to release.
5.8. If daily sampling is not to occur within 24 hours, the main ladder picket leads and downstream exit gate will be raised. The lab will be properly returned to bypass mode.